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Pineview Reservoir
Weber County, Utah

National Eutrophication Survey, Corvallis, Oreg

Prepared for

Corvallis Environmental Research Lab, Oreg

Oct 77

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U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL EUTROPHICATION SURVEY

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16. ABSTRACT

Annual total phosphorus and total nitrogen loadings to the lake were estimated and subdivided according to either point or non-point source origin. An assessment of the lake's trophic condition and limiting nutrient is also provided. All data collected by the U.S.E.P.A. National Eutrophication Survey during the one year study of the lake and its tributaries are included in the report.

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REPORT
ON
PINEVIEW RESERVOIR
WEBER COUNTY
UTAH
EPA REGION VIII
WORKING PAPER No. 853

WITH THE COOPERATION OF THE
UTAH STATE DIVISION OF HEALTH
AND THE
UTAH NATIONAL GUARD
OCTOBER, 1977

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FOREWORD

The National Eutrophication Survey was initiated in 1972 in response to an Administration commitment to investigate the nationwide threat of accelerated eutrophication to freshwater lakes and reservoirs.

OBJECTIVES

The Survey was designed to develop, in conjunction with state environmental agencies, information on nutrient sources, concentrations, and impact on selected freshwater lakes as a basis for formulating comprehensive and coordinated national, regional, and state management practices relating to point-source discharge reduction and non-point source pollution abatement in lake watersheds.

ANALYTIC APPROACH

The mathematical and statistical procedures selected for the Survey's eutrophication analysis are based on related concepts that:

a. A generalized representation or model relating sources, concentrations, and impacts can be constructed.

b. By applying measurements of relevant parameters associated with lake degradation, the generalized model can be transformed into an operational representation of a lake, its drainage basin, and related nutrients.

c. With such a transformation, an assessment of the potential for eutrophication control can be made.

LAKE ANALYSIS

In this report, the first stage of evaluation of lake and watershed data collected from the study lake and its drainage basin is documented. The report is formatted to provide state environmental agencies with specific information for basin planning [§303(e)], water quality criteria/standards review [§303(c)], clean lakes [§314(a,b)], and water quality monitoring [§106 and §305(b)] activities mandated by the Federal Water Pollution Control Act Amendments of 1972.

Beyond the single lake analysis, broader based correlations between nutrient concentrations (and loading) and trophic condition are being made to advance the rationale and data base for refinement of nutrient water quality criteria for the Nation's fresh water lakes. Likewise, multivariate evaluations for the relationships between land use, nutrient export, and trophic condition, by lake class or use, are being developed to assist in the formulation of planning guidelines and policies by EPA and to augment plans implementation by the states.

ACKNOWLEDGEMENT

The staff of the National Eutrophication Survey (Office of Research and Development, U.S. Environmental Protection Agency) expresses sincere appreciation to the Utah Department of Social Services and the Utah Department of Natural Resources for professional involvement, to the Utah National Guard for conducting the tributary sampling phase of the Survey, and to those Utah wastewater treatment plant operators who voluntarily provided effluent samples and flow data.

The staffs of the Bureau of Water Quality of the Division of Health and the Division of Wildlife Resources provided invaluable lake documentation and counsel during the Survey, reviewed the preliminary reports, and provided critiques most useful in the preparation of this Working Paper series.

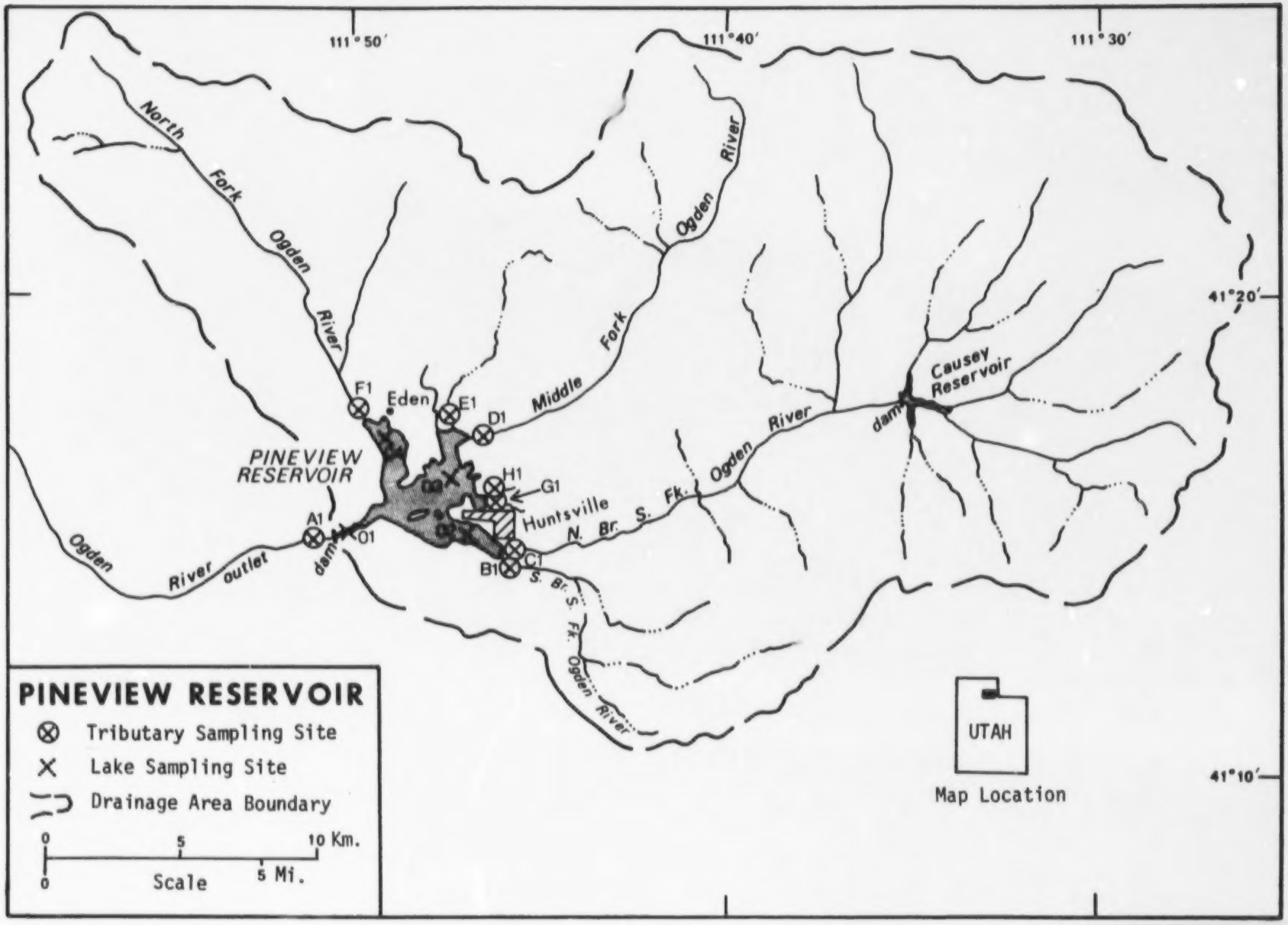
Major General Maurice L. Watts, the Adjutant General of Utah, and Project Officer Lt. Colonel T. Ray Kingston, who directed the volunteer efforts of the Utah National Guardsmen, are also gratefully acknowledged for their assistance to the Survey.

NATIONAL EUTROPHICATION SURVEY

STUDY LAKES AND RESERVOIRS

STATE OF UTAH

NAME	COUNTY
Bear	Rich, UT; Bear Lake, ID
Deer Creek	Wasatch
Echo	Summit
Fish	Sevier
Flaming Gorge	Daggett, UT; Sweetwater, WY
Huntington	Emery
Joes Valley	Emery
Lower Bowns	Garfield
Lynn	Box Elder
Minersville	Beaver
Moon	Duchesne
Navajo	Kane
Newcastle	Iron
Otter Creek	Piute
Panguich	Garfield
Pelican	Uintah
Pineview	Weber
Piute	Piute
Porcupine	Cache
Powell	Garfield, Kane, San Juan, UT; Coconino, AZ
Pruess	Millard
Sevier Bridge	Juab, Sanpete
Starvation	Duchesne
Steinaker	Uintah
Tropic	Garfield
Utah	Utah
Willard Bay	Box Elder


111°50′
111°40′
111°30′
41°20′
41°10′
North Fork Ogden River
Ogden River
Middle Fork
Causey Reservoir
dam
PINEVIEW RESERVOIR
F1
Eden
E1
D1
H1
G1
Huntsville
N. Br. S. Fk. Ogden River
A1
O1
dam
Ogden River outlet
B1
C1
S. Br. S. Fk. Ogden River
PINEVIEW RESERVOIR
Tributary Sampling Site
Lake Sampling Site
Drainage Area Boundary
0
5
10 Km.
0
Scale
5 Mi.
UTAH
Map Location

PINEVIEW RESERVOIR

STORET NO. 4916

I. CONCLUSIONS

A. Trophic Condition:

Survey data indicate that Pineview Reservoir is eutrophic. It ranked sixteenth in overall trophic quality among the 27 Utah lakes and reservoirs sampled in 1975 when compared using a combination of six parameters*. Thirteen of the water bodies had less median total phosphorus, ten had less and three had the same median orthophosphorus, 22 had less median inorganic nitrogen, 11 had less mean chlorophyll a, and 16 had greater mean Secchi disc transparency. Depression of dissolved oxygen with depth occurred at all four sampling stations in August and at station 1 in September.

Survey limnologists noted floating macrophytes, particularly in the North Fork arm near station 4 (see map, page v).

B. Rate-Limiting Nutrient:

The algal assay results indicate Pineview Reservoir was phosphorus limited at the time the sample was collected (09/23/75). The reservoir data indicate phosphorus limitation at all sampling times.

C. Nutrient Controllability:

1. Point sources--No known wastewater treatment plants impacted the reservoir during the sampling year. Septic tanks

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* See Appendix A.

accounted for an estimated 0.3% of the total phosphorus input to Pineview Reservoir during the sampling year, but a shoreline survey would have to be done to determine the significance of those sources.

The present phosphorus loading of 0.72 g/m^2/year is a little less than that proposed by Vollenweider (Vollenweider and Dillon, 1974) as a eutrophic loading (see page 12). However, this loading estimate probably is too low since there was an apparent phosphorus loss during the sampling year. Also, 25% of the inflow (1.558 m^3/sec) is ground water (Cruff, 1976), and the phosphorus contribution of this source had to be estimated.

Because the reservoir is phosphorus limited, inputs should be minimized to the greatest practicable extent to reduce the present rate of eutrophication.

2. Non-point sources--Non-point sources accounted for 99.7% of the total phosphorus load during the sampling year. The North and South branches of the South Fork Ogden River contributed 34.5%, the North Fork Ogden River contributed 10.4%, and four other gaged tributaries collectively contributed 16.9%. Ground water was estimated to have accounted for 26.5% of the total, and the ungaged minor tributaries and immediate drainage contributed an estimated 9.0%.

Survey limnologists noted that much of the land use around the reservoir and in the drainage basin is agricultural, and

nutrients in runoff may contribute to the eutrophication of the reservoir. Further study is needed to determine the contribution and controllability of nutrients from this source.

II. RESERVOIR AND DRAINAGE BASIN CHARACTERISTICS†

A. Morphometry††:

1. Surface area: 10.12 kilometers^2.
2. Mean depth: 13.4 meters.
3. Maximum depth: 24.7 meters.
4. Volume: 135.684 x 10^6 m^3.
5. Mean hydraulic retention time: 248 days.

B. Tributary and Outlet:
(See Appendix C for flow data)

1. Tributaries -

Name	Drainage area (km^2)*	Mean flow (m^3/sec)*
North & South Br., S. Fk. Ogden River	440.3	2.200
Middle Fk. Ogden River	85.5	0.589
Gersten Creek	17.1	0.130
N. Fk. Ogden River	160.6	1.000
Spring Creek	19.4	0.270
Unnamed Canal H-1	-	0.066
Ground water	-	1.558**
Minor tributaries & immediate drainage -	69.9	0.530
Totals	792.8	6.343

2. Outlet -

Ogden River	802.9***	6.320

C. Precipitation****:

1. Year of sampling: 78.5 centimeters.
2. Mean annual: 51.1 centimeters.

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† Table of metric conversions--Appendix B.
†† Sudweeks, 1975; maximum depth from Ikner (1975).
* For limits of accuracy, see Working Paper No. 175, "...Survey Methods, 1973-1976".
** Cruff, 1976.
*** Includes area of reservoir.
**** See Working Paper No. 175.

III. WATER QUALITY SUMMARY

Pineview Reservoir was sampled three times during the open-water season of 1975 by means of a pontoon-equipped Huey helicopter. Each time, samples for physical and chemical parameters were collected from a number of depths at four stations on the reservoir (see map, page v). During each visit, a single depth-integrated (4.6 m to surface) sample was composited from the stations for phytoplankton identification and enumeration; and during the last visit, a single 18.9-liter depth-integrated sample was composited for algal assays. Also each time, a depth-integrated sample was collected from each of the stations for chlorophyll a analysis. The maximum depths sampled were 20.7 meters at station 1, 12.5 meters at station 2, 16.8 meters at station 3, and 12.2 meters at station 4.

The sampling results are presented in full in Appendix D and are summarized in the following table.

A. SUMMARY OF PHYSICAL AND CHEMICAL CHARACTERISTICS FOR PINEVIEW RESERVOIR
STORET CODE 4916

PARAMETER	1ST SAMPLING (5/14/75) 4 SITES RANGE	MEAN	MEDIAN	2ND SAMPLING (8/ 7/75) 4 SITES RANGE	MEAN	MEDIAN	3RD SAMPLING (9/23/75) 4 SITES RANGE	MEAN	MEDIAN
TEMP (C)	6.3 - 11.3	8.4	8.3	11.1 - 23.8	18.7	21.1	17.0 - 18.6	18.3	18.5
DISS OXY (MG/L)	9.0 - 11.0	9.9	9.8	0.6 - 7.2	4.3	3.8	0.4 - 7.9	5.8	6.2
CNDCTVY (MCROMO)	125. - 166.	156.	160.	153. - 237.	198.	207.	197. - 223.	216.	217.
PH (STAND UNITS)	8.0 - 9.0	8.5	8.4	7.8 - 8.9	8.3	8.1	7.5 - 8.2	8.0	8.1
TOT ALK (MG/L)	85. - 109.	101.	105.	95. - 113.	106.	110.	124. - 134.	130.	130.
TOT P (MG/L)	0.023 - 0.117	0.051	0.051	0.017 - 0.043	0.026	0.024	0.018 - 0.090	0.034	0.026
ORTHO P (MG/L)	0.005 - 0.016	0.010	0.009	0.003 - 0.018	0.007	0.006	0.002 - 0.014	0.005	0.004
NO2+NO3 (MG/L)	0.160 - 0.610	0.366	0.360	0.030 - 0.460	0.233	0.180	0.030 - 0.090	0.047	0.040
AMMONIA (MG/L)	0.030 - 0.070	0.039	0.040	0.040 - 0.410	0.147	0.100	0.020 - 0.160	0.037	0.020
KJEL N (MG/L)	0.300 - 1.100	0.518	0.500	0.400 - 0.700	0.519	0.500	0.200 - 0.500	0.300	0.300
INORG N (MG/L)	0.200 - 0.640	0.405	0.390	0.130 - 0.680	0.380	0.430	0.050 - 0.220	0.084	0.060
TOTAL N (MG/L)	0.620 - 1.490	0.884	0.860	0.430 - 0.960	0.752	0.800	0.230 - 0.590	0.347	0.340
CHLRPYL A (UG/L)	5.0 - 15.6	9.0	7.8	2.5 - 4.5	3.7	3.8	2.7 - 7.3	4.4	3.7
SECCHI (METERS)	0.6 - 1.1	0.8	0.7	1.8 - 2.6	2.3	2.4	1.2 - 2.4	1.9	2.0

B. Biological Characteristics:

1. Phytoplankton -

Sampling Date	Dominant Genera	Algal Units per ml
05/14/75	1. Chroomonas sp.	2,552
	2. Cryptomonas sp.	1,411
	3. Chlamydomonas sp.	489
	4. Schroederia sp.	326
	5. Flagellates	217
	Other genera	217
	Total	5,212
08/07/75	1. Fragilaria sp.	681
	2. Cryptomonas sp.	306
	3. Chroomonas sp.	211
	4. Cysts	118
	5. Schroederia sp.	118
	Other genera	69
	Total	1,503
09/23/75	1. Fragilaria sp.	332
	2. Aphanizomenon sp.	166
	3. Chroomonas sp.	166
	4. Cryptomonas sp.	165
	5. Stephanodiscus sp.	41
	Total	870

2. Chlorophyll a -

Sampling Date	Station Number	Chlorophyll a (µg/l)
05/14/75	1	15.6
	2	7.0
	3	5.0
	4	8.5
08/07/75	1	2.5
	2	4.1
	3	4.5
	4	3.6
09/23/75	1	2.7
	2	3.2
	3	4.3
	4	7.3

C. Limiting Nutrient Study:

1. Autoclaved, filtered, and nutrient spiked -

Spike (mg/l)	Ortho P Conc. (mg/l)	Inorganic N Conc. (mg/l)	Maximum yield (mg/l-dry wt.)
Control	0.005	0.163	0.2
0.050 P	0.055	0.163	6.3
0.050 P + 1.0 N	0.055	1.163	18.7
1.0 N	0.005	1.163	0.2

2. Discussion -

The control yield of the assay alga, Selenastrum capricornutum, indicates that the potential primary productivity of Pineview Reservoir was moderate at the time the sample was collected (09/23/75). Also, the significant increase in yield with the addition of phosphorus alone indicates the reservoir was phosphorus limited at that time. Note that the addition of nitrogen alone resulted in a yield no greater than that of the control.

The reservoir data also indicate phosphorus limitation. The mean inorganic nitrogen/orthophosphorus ratios were 17/1 or greater at all sampling times, and phosphorus limitation would be expected.

IV. NUTRIENT LOADINGS
(See Appendix E for data)

For the determination of nutrient loadings, the Utah National Guard collected monthly near-surface grab samples from each of the tributary sites indicated on the map (page v). Sampling was begun in November, 1974, and was completed in September, 1975.

Through an interagency agreement, stream flow estimates for the year of sampling and a "normalized" or average year were provided by the Utah District Office of the U.S. Geological Survey for the tributary sites nearest the reservoir.

In this report, nutrient loads for sampled tributaries were calculated using mean annual concentrations and mean annual flows. Nutrient loads for unsampled ground water and "minor tributaries and immediate drainage" ("ZZ" of U.S.G.S.) were estimated using the mean concentrations in the eight sampled tributaries and the mean annual ground-water and ZZ flows.

No known wastewater treatment plants impacted the reservoir during the sampling year.

A. Waste Sources:

1. Known municipal - None
2. Known industrial - None

B. Annual Total Phosphorus Loading - Average Year:

1. Inputs -

Source	kg P/ yr	% of total
a. Tributaries (non-point load) -		
N. & S. Br., S. Fk. Ogden River	2,500	34.5
Middle Fk. Ogden River	370	5.1
Gertsen Creek	310	4.3
N. Fk. Ogden River	755	10.4
Spring Creek	475	6.6
Unnamed Canal H-1	65	0.9
Ground water	1,915	26.5
b. Minor tributaries & immediate drainage (non-point load) -	650	9.0
c. Known municipal STP's - None	-	-
d. Septic tanks* -	25	0.3
e. Known industrial - None	-	-
f. Direct precipitation** -	175	2.4
Total	7,240	100.0

2. Outputs -

Reservoir outlet - Ogden River 7,775

3. Net annual P loss - 535 kg.

* Estimate based on 50 shoreline dwellings; see Working Paper No. 175.
** See Working Paper No. 175.

C. Annual Total Nitrogen Loading - Average Year:

1. Inputs -

Source	kg N/yr	% of total
a. Tributaries (non-point load) -		
N. & S. Br., S. Fk. Ogden River	67,785	31.5
Middle Fk. Ogden River	12,075	5.6
Gertsen Creek	3,675	1.7
N. Fk. Ogden River	39,200	18.2
Spring Creek	12,490	5.8
Unnamed Canal H-1	2,180	1.0
Ground water	49,230	22.9
b. Minor tributaries & immediate drainage (non-point load) -	16,750	7.8
c. Known municipal STP's - None	-	-
d. Septic tanks* -	855	0.4
e. Known industrial - None	-	-
f. Direct precipitation** -	10,925	5.1
Total	215,165	100.0

2. Outputs -

Reservoir outlet - Ogden River 189,145

3. Net annual N accumulation - 26,020 kg.

D. Non-point Nutrient Export by Subdrainage Area:

Tributary	kg P/km^2/yr	kg N/km^2/yr
N. & S. Br., S. Fk. Ogden River	6	154
Middle Fork Ogden River	4	141
Gertsen Creek	18	215
N. Fk. Ogden River	5	244
Spring Creek	24	644

* Estimate based on 50 shoreline dwellings; see Working Paper No. 175.
** See Working Paper No. 175.

E. Yearly Loads:

In the following table, the existing phosphorus loadings are compared to those proposed by Vollenweider (Vollenweider and Dillon, 1974). Essentially, his "dangerous" loading is one at which the receiving water would become eutrophic or remain eutrophic; his "permissible" loading is that which would result in the receiving water remaining oligotrophic or becoming oligotrophic if morphometry permitted. A mesotrophic loading would be considered one between "dangerous" and "permissible".

Note that Vollenweider's model may not be applicable to water bodies with short hydraulic retention times.

	Total Phosphorus		Total Nitrogen	
	Total	Accumulated	Total	Accumulated
grams/m^2/yr	0.72	loss*	21.3	2.6

Vollenweider phosphorus loadings ($g/m^2/yr$) based on mean depth and mean hydraulic retention time of Pineview Reservoir:

"Dangerous" (eutrophic loading)	0.84
"Permissible" (oligotrophic loading)	0.42

* There was an apparent loss of phosphorus during the sampling year. This may have been due to resolubilization of previously sedimented phosphorus, underestimation of the ground-water phosphorus contribution, or unsampled point sources discharging directly to the lake.

V. LITERATURE REVIEWED

Cruff, Russell, 1976. Personal communication (hydrological budget). U.S. Geol. Surv., Salt Lake City.

Ikner, James, 1975. Personal communication (reservoir morphometry). U.S. Geol. Surv., Salt Lake City.

Sudweeks, Calvin K., 1975. Personal communication (reservoir morphometry). UT Bur. of Env. Health, Salt Lake City.

Vollenweider, R. A., and P. J. Dillon, 1974. The application of the phosphorus loading concept to eutrophication research. Natl. Res. Council of Canada Publ. No. 13690, Canada Centre for Inland Waters, Burlington, Ontario.

VI. APPENDICES

APPENDIX A

LAKE RANKINGS

LAKE DATA TO BE USED IN RANKINGS

LAKE CODE	LAKE NAME	MEDIAN TOTAL P	MEDIAN INORG N	500-MEAN SEC	MEAN CHLORA	15-MIN DO	MEDIAN DISS ORTHO P
0404	LAKE POWELL	0.010	0.410	339.630	3.081	13.400	0.007
4901	BEAR LAKE	0.011	0.040	253.167	0.945	9.200	0.003
4902	LOWER BOWN'S RESERVOIR	0.031	0.040	336.000	5.567	9.400	0.006
4903	DEER CREEK RESERVOIR	0.038	0.215	430.333	9.078	14.800	0.006
4904	ECHO RESERVOIR	0.047	0.170	450.333	6.967	14.000	0.012
4905	LYNN RESERVOIR	0.121	0.200	417.667	39.600	10.400	0.052
4906	FISH LAKE	0.023	0.040	152.000	12.483	10.400	0.004
4907	HUNTINGTON NORTH RESERVO	0.013	0.040	392.000	1.900	7.800	0.005
4908	JOE'S VALLEY RESERVOIR	0.012	0.045	400.000	2.483	11.200	0.003
4909	MINERSVILLE RESERVOIR	0.192	0.060	445.000	33.583	8.600	0.107
4910	MOON LAKE	0.008	0.040	381.000	2.700	9.600	0.002
4911	NAVAJO LAKE	0.016	0.040	368.000	2.000	6.000	0.003
4912	NEWCASTLE RESERVOIR	0.051	0.040	428.667	12.467	13.600	0.009
4913	OTTER CREEK RESERVOIR	0.067	0.040	453.667	11.767	10.600	0.033
4914	PANGUITCH LAKE	0.071	0.040	426.500	45.950	14.200	0.010
4915	PELICAN LAKE	0.044	0.050	438.500	6.350	8.400	0.004
4916	PINEVIEW RESERVOIR	0.028	0.300	435.083	5.692	14.600	0.006
4917	PIUTE RESERVOIR	0.047	0.150	482.625	25.329	11.600	0.007
4918	PORCUPINE RESERVOIR	0.025	0.110	440.000	7.860	12.400	0.011
4919	PRUESS RESERVOIR (GARRIS	0.057	0.140	491.000	4.533	8.800	0.008
4920	SEVIER BRIDGE RESERVOIR	0.026	0.355	449.778	18.222	12.400	0.008
4921	STARVATION RESERVOIR	0.016	0.040	394.583	5.675	13.200	0.004
4922	STEINAKER RESERVOIR	0.011	0.040	316.750	1.844	12.600	0.005
4923	TROPIC RESERVOIR	0.021	0.050	425.000	7.200	8.400	0.006
4924	UTAH LAKE	0.132	0.320	490.583	72.012	11.400	0.012
4925	WILLARD BAY RESERVOIR	0.044	0.060	457.182	7.567	11.000	0.009
5605	FLAMING GORGE RESERVOIR	0.011	0.690	285.636	2.500	10.400	0.003

PERCENT OF LAKES WITH HIGHER VALUES (NUMBER OF LAKES WITH HIGHER VALUES)

LAKE CODE	LAKE NAME	MEDIAN TOTAL P	MEDIAN INORG N	500-MEAN SEC	MEAN CHLOR-A	15-MIN DO	MEDIAN DISS ORTHO P	INDEX NO
0408	LAKE POWELL	96 (25)	4 (1)	81 (21)	73 (19)	15 (4)	42 (11)	311
4901	BEAR LAKE	90 (23)	87 (19)	96 (25)	100 (26)	77 (20)	90 (23)	540
4902	LOWER BOWN'S RESERVOIR	46 (12)	87 (19)	85 (22)	65 (17)	73 (19)	50 (13)	406
4903	DEER CREEK RESERVOIR	42 (11)	19 (5)	42 (11)	35 (9)	0 (0)	58 (14)	196
4904	ECHO RESERVOIR	31 (8)	27 (7)	19 (5)	50 (13)	12 (3)	13 (3)	152
4905	LYNN RESERVOIR	8 (2)	23 (6)	58 (15)	8 (2)	62 (15)	4 (1)	163
4906	FISH LAKE	62 (16)	65 (16)	100 (26)	23 (6)	62 (15)	79 (20)	391
4907	HUNTINGTON NORTH RESERVO	77 (20)	65 (16)	69 (18)	92 (24)	96 (25)	69 (18)	468
4908	JOE'S VALLEY RESERVOIR	81 (21)	58 (15)	62 (16)	85 (22)	46 (12)	96 (25)	428
4909	MINERSVILLE RESERVOIR	0 (0)	44 (11)	27 (7)	12 (3)	85 (22)	0 (0)	168
4910	MOON LAKE	100 (26)	87 (19)	73 (19)	77 (20)	69 (18)	100 (26)	506
4911	NAVAJO LAKE	69 (18)	87 (19)	77 (20)	88 (23)	100 (26)	85 (22)	506
4912	NEWCASTLE RESERVOIR	23 (6)	87 (19)	46 (12)	27 (7)	19 (5)	27 (7)	229
4913	OTTER CREEK RESERVOIR	15 (4)	87 (19)	15 (4)	31 (8)	54 (14)	8 (2)	210
4914	PANGUITCH LAKE	12 (3)	65 (16)	50 (13)	4 (1)	8 (2)	23 (6)	162
4915	PELICAN LAKE	37 (9)	54 (14)	35 (9)	54 (14)	90 (23)	73 (19)	343
4916	PINEVIEW RESERVOIR	50 (13)	15 (4)	38 (10)	58 (15)	4 (1)	58 (14)	223
4917	PIUTE RESERVOIR	27 (7)	31 (8)	8 (2)	15 (4)	38 (10)	46 (12)	165
4918	PORCUPINE RESERVOIR	58 (15)	38 (10)	31 (8)	38 (10)	33 (8)	19 (5)	217
4919	PRUESS RESERVOIR (GARRIS	19 (5)	35 (9)	0 (0)	69 (18)	81 (21)	37 (9)	241
4920	SEVIER BRIDGE RESERVOIR	54 (14)	8 (2)	23 (6)	19 (5)	33 (8)	37 (9)	174
4921	STARVATION RESERVOIR	73 (19)	87 (19)	65 (17)	62 (16)	23 (6)	79 (20)	389
4922	STEINAKER RESERVOIR	85 (22)	87 (19)	88 (23)	96 (25)	27 (7)	65 (17)	448
4923	TROPIC RESERVOIR	65 (17)	50 (13)	54 (14)	46 (12)	90 (23)	58 (14)	363
4924	UTAH LAKE	4 (1)	12 (3)	4 (1)	0 (0)	42 (11)	13 (3)	75
4925	WILLARD BAY RESERVOIR	37 (9)	44 (11)	12 (3)	42 (11)	50 (13)	31 (8)	216
5605	FLAMING GORGE RESERVOIR	90 (23)	0 (0)	92 (24)	81 (21)	62 (15)	90 (23)	415

LAKES RANKED BY INDEX NOS.

RANK	LAKE CODE	LAKE NAME	INDEX NO
1	4901	BEAR LAKE	540
2	4911	NAVAJO LAKE	506
3	4910	MOON LAKE	506
4	4907	HUNTINGTON NORTH RESERVO	468
5	4922	STEINAKER RESERVOIR	448
6	4908	JOE'S VALLEY RESERVOIR	428
7	5605	FLAMING GORGE RESERVOIR	415
8	4902	LOWER BOWN'S RESERVOIR	406
9	4906	FISH LAKE	391
10	4921	STARVATION RESERVOIR	389
11	4923	TROPIC RESERVOIR	363
12	4915	PELICAN LAKE	343
13	0408	LAKE POWELL	311
14	4919	PRUESS RESERVOIR (GARRIS	241
15	4912	NEWCASTLE RESERVOIR	229
16	4916	PINEVIEW RESERVOIR	223
17	4918	PORCUPINE RESERVOIR	217
18	4925	WILLARD BAY RESERVOIR	216
19	4913	OTTER CREEK RESERVOIR	210
20	4903	DEER CREEK RESERVOIR	196
21	4920	SEVIER BRIDGE RESERVOIR	174
22	4909	MINERSVILLE RESERVOIR	168
23	4917	PIUTE RESERVOIR	165
24	4905	LYNN RESERVOIR	163
25	4914	PANQUITCH LAKE	162
26	4904	ECHO RESERVOIR	152

APPENDIX B

CONVERSION FACTORS

CONVERSION FACTORS

Hectares x 2.471 = acres

Kilometers x 0.6214 = miles

Meters x 3.281 = feet

Cubic meters x 8.107×10^{-4} = acre/feet

Square kilometers x 0.3861 = square miles

Cubic meters/sec x 35.315 = cubic feet/sec

Centimeters x 0.3937 = inches

Kilograms x 2.205 = pounds

Kilograms/square kilometer x 5.711 = lbs/square mile

APPENDIX C

TRIBUTARY FLOW DATA

TRIBUTARY FLOW INFORMATION FOR UTAH 10/18/76

LAKE CODE 4916 PINEVIEW RES

TOTAL DRAINAGE AREA OF LAKE(SQ KM) 802.9

TRIBUTARY	SUB-DRAINAGE AREA(SQ KM)	NORMALIZED FLOWS(CMS) JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MEAN
4916A1	802.9	3.40	3.68	6.51	9.63	13.88	7.93	9.06	7.93	5.95	2.78	2.27	2.55	6.32
4916B1	440.3	0.76	1.50	1.76	7.36	10.19	2.55	0.54	0.28	0.23	0.20	0.31	0.74	2.20
4916C1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4916D1	85.5	0.057	0.227	0.311	2.832	3.115	0.396	0.028	0.006	0.014	0.006	0.008	0.057	0.589
4916E1	17.1	0.028	0.028	0.057	0.142	0.283	0.283	0.227	0.227	0.170	0.057	0.028	0.028	0.130
4916F1	160.6	0.170	0.736	0.793	4.248	4.248	1.416	0.142	0.028	0.057	0.0	0.0	0.198	1.000
4916G1	19.4	0.20	0.28	0.31	0.37	0.42	0.45	0.25	0.20	0.20	0.17	0.20	0.23	0.27
4916H1	0.0	0.028	0.028	0.028	0.028	0.057	0.057	0.142	0.142	0.113	0.085	0.057	0.028	0.066
4916ZZ	80.3	0.37	0.57	0.59	0.71	0.82	0.91	0.51	0.37	0.40	0.34	0.40	0.42	0.53

SUMMARY

TOTAL DRAINAGE AREA OF LAKE = 802.9
SUM OF SUB-DRAINAGE AREAS = 803.2
TOTAL FLOW IN = 57.54
TOTAL FLOW OUT = 75.55

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
4916A1	11	74	0.510	9	0.510				
	12	74	2.039	19	2.747				
	1	75	4.248						
	2	75	3.964						
	3	75	2.124						
	4	75	19.539	23	30.016				
	5	75	27.467	12	20.105	23	34.547		
	6	75	15.574	22	24.069				
	7	75	10.760	18	7.646				
	8	75	12.743	12	13.026				
	9	75	8.495						
	10	75	4.814						
4916B1	11	74	1.359	9	1.359				
	12	74	1.359	19	1.388				
	1	75	1.331	11	1.359				
	2	75	1.189	8	1.133				
	3	75	2.067						
	4	75	4.814	23	8.495				
	5	75	17.840	23	24.069				
	6	75	9.345	22	6.796				
	7	75	1.218	18	0.906				
	8	75	0.170	12	0.113				
	9	75	0.085						
	10	75	1.189						

TRIBUTARY FLOW INFORMATION FOR UTAH 10/18/76

LAKE CODE 4916 PINEVIEW RES

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
4916D1	11	74	0.227	9	0.227				
	12	74	0.057	19	0.057				
	1	75	0.028	11	0.028				
	2	75	0.028	8	0.028				
	3	75	0.566						
	4	75	1.841	23	5.097				
	5	75	7.362	23	6.796				
	6	75	0.850	22	0.708				
	7	75	0.057	18	0.057				
	8	75	0.028	12	0.028				
	9	75	0.014						
	10	75	0.057						
4916E1	11	74	0.028						
	12	74	0.028						
	1	75	0.028						
	2	75	0.028						
	3	75	0.057						
	4	75	0.113						
	5	75	0.283						
	6	75	0.425						
	7	75	0.283						
	8	75	0.227						
	9	75	0.170						
	10	75	0.057						
4916F1	11	74	0.011	9	0.011				
	12	74	0.170	19	0.170				
	1	75	0.003	11	0.003				
	2	75	0.003	8	0.003				
	3	75	0.283						
	4	75	1.982	23	5.663				
	5	75	13.309	23	12.743				
	6	75	8.495	22	5.663				
	7	75	0.623	18	0.396				
	8	75	0.142	12	0.170				
	9	75	0.057						
	10	75	0.011						
4916G1	11	74	0.283						
	12	74	0.227						
	1	75	0.227						
	2	75	0.198						
	3	75	0.566						
	4	75	0.368						
	5	75	0.425						
	6	75	0.821						
	7	75	0.566						
	8	75	0.340						
	9	75	0.283						
	10	75	0.340						

TRIBUTARY FLOW INFORMATION FOR UTAH 10/18/76

LAKE CODE 4916 PINEVIEW RES

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
4916M1	11	74	0.057						
	12	74	0.028						
	1	75	0.028						
	2	75	0.028						
	3	75	0.028						
	4	75	0.028						
	5	75	0.028						
	6	75	0.057						
	7	75	0.113						
	8	75	0.142						
	9	75	0.142						
	10	75	0.113						
4916ZZ	11	74	0.934						
	12	74	0.736						
	1	75	0.736						
	2	75	0.651						
	3	75	1.869						
	4	75	1.218						
	5	75	1.388						
	6	75	2.690						
	7	75	1.869						
	8	75	1.104						
	9	75	0.934						
	10	75	1.104						

APPENDIX D

PHYSICAL and CHEMICAL DATA

STORET RETRIEVAL DATE 76/08/12

491601
41 15 19.0 111 50 21.0 3
PINEVIEW RESERVOIR
49057 UTAH

11EPALES 760109 2111202
0055 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
75/05/14	10	25 0000	9.5	9.0	42	164	8.50	105	0.030	0.700	0.290	0.016
	10	25 0005	9.2	11.0		162	8.50	103	0.030	0.500	0.330	0.010
	10	25 0010	8.9	10.6		164	8.40	105	0.030	0.400	0.370	0.015
	10	25 0025	8.2	10.4		165	8.40	103	0.030	0.500	0.360	0.008
	10	25 0051	7.0	9.6		160	8.20	108	0.040	0.300	0.460	0.015
75/08/07	11	30 0000	21.5	5.2	102	221	8.50	111	0.100	0.500	0.160	0.006
	11	30 0005	21.4	4.2		217	8.15	110	0.230	0.600	0.160	0.007
	11	30 0016	20.0	2.0		192	7.90	105	0.100	0.500	0.300	0.005
	11	30 0030	13.5	3.4		163	7.85	96	0.050	0.400	0.400	0.005
	11	30 0050	11.9	2.6		156	7.80	95	0.120	0.500	0.460	0.015
	11	30 0068	11.1	3.6		153	8.05	102	0.130	0.500	0.390	0.018
75/09/23	10	00 0000	18.2	7.9	48	211	8.20	131	0.020	0.200	0.030	0.004
	10	00 0005	18.1	5.4		213	7.90	131	0.020K	0.200	0.080	0.003
	10	00 0015	18.1	5.4		211	7.90	130	0.020K	0.200	0.080	0.003
	10	00 0035	18.1	2.0		213	7.60	130	0.120	0.500	0.090	0.014
	10	00 0061	17.0	0.4		197	7.50	124	0.160	0.500	0.060	0.012

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT REMNING PERCENT
75/05/14	10	25 0000	0.050	15.6	
	10	25 0005	0.051		
	10	25 0010	0.042		
	10	25 0025	0.039		
	10	25 0051	0.023		
75/08/07	11	30 0000	0.027	2.5	
	11	30 0005	0.028		
	11	30 0016	0.023		
	11	30 0030	0.024		
	11	30 0050	0.036		
	11	30 0068	0.040		
75/09/23	10	00 0000	0.026	2.7	
	10	00 0005	0.020		
	10	00 0015	0.022		
	10	00 0035	0.076		
	10	00 0061	0.090		

K VALUE KNOWN TO BE

STORET RETRIEVAL DATE 75/08/12

491602
41 15 28.0 111 47 43.0 3
PINEVIEW RESERVOIR
49057 UTAH

150791

11EPALES 2111202
0023 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
75/05/14	10 50	0000	10.0	9.4	22	166	8.70	106	0.040	0.400	0.220	0.007
	10 50	0005	9.5	10.0		166	8.45	105	0.040	0.500	0.280	0.006
	10 50	0015	7.7	9.4		160	8.20	104	0.040	0.400	0.340	0.008
	10 50	0019	7.4	10.6		160	8.50	105	0.040	0.600	0.250	0.007
75/08/07	11 00	0000	23.3	7.2	96	237	8.70	113	0.270	0.400	0.030	0.006
	11 00	0005	23.1	7.2		230	8.70	112	0.140	0.400	0.040	0.004
	11 00	0016	22.7	6.8		225	8.60	110	0.100	0.500	0.060	0.004
	11 00	0030	15.4	2.4		190	8.00	104	0.080	0.500	0.350	0.009
	11 00	0041	13.6	3.0		165	7.90	101	0.060	0.500	0.400	0.011
75/09/23	09 45	0000	18.3	7.8	60	219	8.10	131	0.020	0.200	0.040	0.004
	09 45	0005	18.6	6.6		222	8.10	133	0.020	0.200	0.030	0.005
	09 45	0015	18.5	6.2		221	8.10	134	0.030	0.200	0.040	0.007
	09 45	0024	18.5	6.2		221	8.10	131	0.020	0.200	0.030	0.005

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT REMNING PERCENT
75/05/14	10 50	0000	0.070	7.0	
	10 50	0005	0.063		
	10 50	0015	0.059		
	10 50	0019	0.078		
75/08/07	11 00	0000	0.029	4.1	
	11 00	0005	0.028		
	11 00	0016	0.023		
	11 00	0030	0.032		
	11 00	0041	0.032		
75/09/23	09 45	0000	0.021	3.2	
	09 45	0005	0.028		
	09 45	0015	0.032		
	09 45	0024	0.028		

26

STORET RETRIEVAL DATE 75/09/12

491603
+1 15 17.0 111 47 +1.0 3
PINEVIE# RESERVOIR
49057 UTAH

11EPALES 760109 2111202
0046 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 #ATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
75/05/14	11 15	0000	10.3	11.0	31	161	9.00	107	0.040	0.600	0.160	0.005
	11 15	0005	9.1	10.8		150	8.70	93	0.030	0.600	0.280	0.008
	11 15	0026	6.9	9.0		150	8.20	109	0.070	0.400	0.480	0.013
	11 15	0042	6.3	9.0		160	8.20	109	0.070	0.400	0.490	0.012
75/08/07	11 50	0000	22.9	6.4	90	221	8.80	111	0.040	0.500	0.100	0.005
	11 50	0005	22.8	6.2		225	8.80	112	0.090	0.600	0.070	0.004
	11 50	0015	22.8	6.6		225	8.75	113	0.060	0.600	0.070	0.006
	11 50	0030	16.0	0.6		179	8.00	105	0.080	0.500	0.350	0.005
	11 50	0055	12.4	1.6		161	8.00	99	0.060	0.500	0.440	0.017
75/09/23	09 30	0000	18.5	6.9	96	218	8.10	129	0.020K	0.300	0.040	0.002K
	09 30	0005	18.6	6.6		218	8.10	130	0.020	0.300	0.040	0.005
	09 30	0015	18.6	6.2		218	8.00	130	0.030	0.400	0.040	0.005
	09 30	0038	18.3	5.6		223	8.05	133	0.040	0.400	0.040	0.008

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT REMNING PERCENT
75/05/14	11 15	0000	0.053	5.0	
	11 15	0005	0.052		
	11 15	0026	0.024		
	11 15	0042	0.024		
75/08/07	11 50	0000	0.019	4.5	
	11 50	0005	0.019		
	11 50	0015	0.019		
	11 50	0030	0.020		
	11 50	0055	0.034		
75/09/23	09 30	0000	0.029	4.3	
	09 30	0005	0.026		
	09 30	0015	0.027		
	09 30	0038	0.055		

K VALUE KNOWN TO BE
LESS THAN INDICATED

37

STORET RETRIEVAL DATE 76/08/12

491604
41 16 33.0 111 48 52.0 3
PINEVIEW RESERVOIR
49057 UTAH

11EPALES 760109 2111202
0029 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
75/05/14	11 40	0000	11.3	9.8	24	147	8.90	85	0.040	1.100	0.390	0.015
	11 40	0005	8.3	10.2		145	8.20	93	0.030	0.400	0.530	0.007
	11 40	0015	7.1	9.2		140	8.00	87	0.030	0.400	0.610	0.014
	11 40	0024	6.7	9.8		125	8.70	91	0.030	0.600	0.390	0.009
75/08/07	12 20	0000	23.7	7.2	72	225	8.90	111	0.060	0.600	0.110	0.005
	12 20	0005	23.8	7.0		225	8.90	110	0.360	0.600	0.090	0.006
	12 20	0015	21.1	3.8		207	8.30	113	0.410	0.700	0.180	0.003
	12 20	0025	16.1	2.0		179	8.00	102	0.340	0.500	0.340	0.004
	12 20	0040	12.9	2.2		157	8.00	99	0.200	0.500	0.400	0.010
75/09/23	09 10	0000	18.6	6.4	96	216	8.10	129	0.020K	0.300	0.040	0.002K
	09 10	0005	18.5	6.4		217	8.10	128	0.020K	0.300	0.040	0.002
	09 10	0015	18.5	6.2		217	8.10	127	0.030	0.300	0.040	0.002
	09 10	0027	18.5	6.2		217	8.10	131	0.020	0.400	0.040	0.002K

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT REMNING PERCENT
75/05/14	11 40	0000	0.117	8.5	
	11 40	0005	0.035		
	11 40	0015	0.035		
	11 40	0024	0.051		
75/08/07	12 20	0000	0.017	3.6	
	12 20	0005	0.017		
	12 20	0015	0.017		
	12 20	0025	0.019		
	12 20	0040	0.043		
75/09/23	09 10	0000	0.018	7.3	
	09 10	0005	0.022		
	09 10	0015	0.026		
	09 10	0027	0.024		

K VALUE KNOWN TO BE
LESS THAN INDICATED

APPENDIX E

TRIBUTARY DATA

STORET RETRIEVAL DATE 76/08/12

4916A1
41 15 20.0 111 50 20.0 4
OGDEN RIVER
49 WEBER COUNTY MAP
O/PINEVIEW RESERVOIR 150791
BELOW PINEVIEW DAM 4.5 MI E OF OGDEN
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/11/09	10 50		0.128	0.500	0.130	0.010	0.030
74/12/19	12 05		0.272	0.600	0.015	0.005K	0.010
75/04/23	15 20		0.590	0.150	0.015	0.020	0.070
75/05/23	15 00		0.375	2.400	0.120	0.025	0.030
75/06/22	14 45		0.480	0.200	0.135		0.040
75/07/18	17 30		0.130	0.100	0.035	0.010	0.035
75/08/12	16 50		0.520	0.200	0.005K	0.025	0.060

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 75/08/12

491681
41 14 50.0 111 45 45.0 4
S BR S FK OGDEN RIVER
49 WEBER COUNTY MAP
T/PINEVIEW RESERVOIR 150791
RT 39 BRDG 9 MI E OF OGDEN
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/11/09	11 15		0.208	0.100	0.025	0.030	0.050
74/12/19	10 40		0.368	0.100	0.005K	0.015	0.020
75/01/11	13 00		0.480	0.600	0.010	0.020	0.040
75/02/08	13 00		0.448	0.600	0.016	0.016	0.020
75/04/23	15 30		0.640	0.550	0.015	0.035	0.190
75/05/23	08 10		1.050	1.500	0.040	0.030	0.050
75/06/22	14 55		0.530	0.750	0.030	0.040	
75/07/18			0.330	0.150	0.025	0.020	0.020
75/08/12	17 00		0.340	0.100	0.005K	0.020	0.030
75/09/14	09 30		1.500	0.200	0.015	0.010	0.020

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 75/08/12

4916C1
41 15 00.0 111 45 35.0 4
N BR S FK OGDEN RIVER
49 WEBER COUNTY MAP
T/PINEVIEW RESERVOIR 150791
RT 39 BRDG .1 MI E OF OGDEN
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/11/09	12 35		0.168	0.200	0.030	0.015	0.015
74/12/19	10 50		0.168	0.100K	0.005	0.005K	0.010K
75/01/11	13 15		0.200	0.100	0.005K	0.010	0.020
75/02/08	13 20		0.288	0.900	0.024	0.008K	0.010
75/04/23	15 35		0.500	0.200	0.010	0.015	0.070
75/05/23	08 15		0.660	1.450	0.030	0.010	0.020
75/06/22	15 00		0.460	0.700	0.030	0.030	
75/07/18	17 40		0.510	0.150	0.010	0.005	0.010K
75/08/12	17 10		0.375	0.100K	0.005K	0.005	0.010K
75/09/14	09 45		1.375	0.400	0.005	0.010	0.040

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/08/12

491601
41 17 15.0 111 46 37.0 4
MIDDLE FORK OGDEN RIVER
49 7.5 HUNTSVILLE
T/PINEVIE# RESERVOIR 150791
7100 E RT BRDG 2 MI N OF HUNTSVILLE
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/11/09	12	20	0.136	0.300	0.035	0.010	0.010
74/12/19	11	25	0.072	0.200	0.045	0.005K	0.010K
75/01/11	13	50	0.112	0.700	0.010	0.005K	0.010K
75/02/08	13	45	0.624	0.500	0.016	0.008K	0.010K
75/04/23	15	50	0.575	0.400	0.090	0.010	0.070
75/05/23			0.240	0.600	0.180	0.010	0.010
75/06/22	15	40	0.300	0.500	0.025	0.015	
75/07/18			0.135	0.150	0.030	0.005	0.010K
75/08/12	17	20	0.210	0.100K	0.005K	0.010	0.030

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 75/06/12

4916E1
41 17 35.0 111 47 15.0 4
GERTSEN CREEK
49 #EBER COUNTY MAP
T/PINEVIE# RESERVOIR 150791
RT 166 BRDG 2 MI ENE OF EDEN
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/11/09	12 30		0.200	0.300	0.115	0.035	0.040
75/02/08	14 00		0.352	0.600	0.040	0.032	0.040
75/04/23	16 00		0.270	0.350	0.035	0.015	0.090
75/05/23			0.730	0.500	0.040	0.030	0.060
75/06/22	15 50		0.780	0.350	0.025	0.010	0.070
75/07/18			0.220	0.250	0.005	0.065	0.130
75/09/14	10 15		1.075	0.300	0.030	0.050	0.100

STORET RETRIEVAL DATE 75/08/12

4916F1
41 17 14.0 111 49 10.0 4
NORTH FORK OGDEN RIVER
49 7.5 HUNTSVILLE
T/PINEVIEW RESERVOIR 150791
ST RT 162 BRDG 1.5 MI S OF EDEN
11EPALES 211120
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/11/09	13 00		0.520	0.600	0.030	0.010	0.010
74/12/19	11 50		0.672	0.100K	0.005K	0.005K	0.010K
75/01/11	14 05		0.760	0.100K	0.005	0.005K	0.010
75/02/08	14 30		0.768	0.300	0.016	0.008K	0.010K
75/04/23	16 10		0.990	0.650	0.010	0.025	
75/05/23			1.570	0.400	0.010	0.010	0.030
75/06/22	16 00		0.750	0.350	0.035	0.070	0.080
75/07/18			0.770	0.100	0.005K	0.010	0.030
75/09/14	10 30		0.985	0.800	0.050	0.005K	0.010K

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/08/12

491551
41 16 00.0 111 46 35.0 4
SPRING CREEK
49 7.5 HUNTSVILLE
T/PINEVIE# RESERVOIR 150791
BRDG ON 7100 EAST ST IN NORTH HUNTSVILLE
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/11/09	12 10		0.464	0.700	0.040	0.025	0.060
74/12/19	11 00		0.552	0.200	0.010	0.005K	0.040
75/01/11	13 00		0.400	0.200	0.030	0.010	0.060
75/02/08	13 30		0.504	1.000	0.048	0.016	0.070
75/04/23	15 40		1.500	0.450	0.095	0.050	0.090
75/05/23			1.000	0.650	0.015	0.020	0.040
75/06/22	15 30		2.300	0.350	0.015	0.005	0.030

K VALUE KNOWN TO BE
LESS THAN INDICATED

RET RETRIEVAL DATE 74/08/12

4916M1
41 17 15.0 111 46 37.0 4
UNNAMED CANAL
49 7.5 HUNTSVILLE
T/PINEVIEW RESERVOIR 150791
BRDG ON 7100 EAST ST .2 MI N OF HUNTSVIL
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/11/09	12 00		0.240	0.800	0.040	0.030	0.030
74/12/19	11 05		0.540	0.250	0.210	0.010	0.020
75/01/11	13 35		0.432	0.500	0.020	0.015	0.030
75/02/08	13 35		0.504	0.600	0.032	0.016	0.030
75/04/23	15 45		0.185	0.400	0.005K	0.025	
75/05/23	08 30		0.352	2.000	0.037	0.030	0.040
75/06/22	15 05		0.230	0.300	0.010	0.015	0.040

K VALUE KNOWN TO BE
LESS THAN INDICATED